REMARKS

Claims 1, 2, 3, 4, 5, 6, 7 and 10/7 are rejected under 35 U.S.C. § 102(b) as being anticipated by Giger et al. (U.S. Patent No. 5,133,020; hereinafter "Giger"). Claims 8, 9, 10/8 and 11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Giger in view of Norimatsu (U.S. Patent No. 6,415,053; hereinafter "Norimatsu"). Applicant adds new claims 12-18 and submits the arguments below in traversal of the prior art rejections.

Applicant's invention relates to a method and a system for detecting suspected anomalous shadows by setting a threshold value matched to the image obtaining environment, in an embodiment. In the embodiment, there is a standard-phantom such as an RMI phantom which has a number of tumor shadows and a number of microcalcification shadow patterns. The patterns may be of different sizes to reflect different levels of detection capability and represent evaluative models. Anomalous shadow patterns, i.e., the evaluative models, in the standard-phantom are detected at a preset detection level. From the detected evaluative models, a detection result data is determined and compared with the preset detection level. If the detection result data is not equal to the preset detection level, then the preset detection level is adjusted.

Rejection of Claims 1-7, and 10/7 under § 102(b) by Giger

Giger discloses analyzing abnormalities in image data. Image data from digital images derived from at least one selected portion of an object, for example, from mammographical digital images of the left and right breasts. The image data from each of the digital images are correlated to remove normal anatomical structure. In the correlated data, an abnormal region is searched for and the found abnormal region is then classified. The overall scheme disclosed by

Giger is shown in Fig. 1, and Figs. 3, 4, 6, and 7 further elaborate the detection process 20 in Fig. 1.

Applicant respectfully submits that claim 1 is patentable because each and every element of the claim is not disclosed or suggested by Giger. For example, claim 1 recites, *inter alia*:

> A method of detecting suspected anomalous shadows, comprising the steps of:
>
> . . . ,
>
> *obtaining phantom-image data* representing a radiation image obtained by said radiation image obtained by said radiation image obtaining means *of a standard phantom* having a shadow pattern formed of a plurality of evaluative models each of which corresponds to a different detection level,
>
> . . . .

In contrast, Giger fails to disclose or suggest the step of obtaining any sort of phantom-image data of a standard phantom. Rather, Giger merely discloses in step 330 (and 430 and 440) determining gray-level frequency distributions of left and right breast images (Fig. 4; col. 5, lines 45-47) in order to determine the presence of possible lesions (Fig. 4, step 370; col. 5, line 63 - col. 6, line 2). The gray-level frequency distributions of breast images are entirely different from a phantom-image data of a standard phantom. Unlike standard phantoms, the gray-level frequency distributions are disclosed in Giger as being used in actual patient diagnosis, i.e., the gray-level frequency distributions are subsequently processed to ultimately determine the probability of malignancy in step 40 of Fig. 1.

Moreover, Giger fails to disclose or suggest setting as the value of the detection parameter a threshold value obtained by performing an image quality evaluation based on the

phantom-image data, as claimed. In the Office Action, the Examiner states that "[t]he histogram consists of pixels at different gray levels. Therefore a cluster of similar gray levels amongst other gray levels represent [sic] shadow patterns." According to this line of reasoning, a shadow pattern would be detected according to the location of the left and right vertical boundaries of the specified percentage area under the gray-level histogram of each left and right breast image. Col. 6, lines 40-44. In Giger, however, there is no adjustment of the left or right vertical boundaries of an area underneath the gray-level histogram, e.g., a 10% area, by performing some sort of image quality evaluation based on the phantom-image data.

The Examiner, however, argues that the threshold values are used as the predetermined detection parameter. In Giger, the threshold values are used to set the upper or lower bounds at portions of the histogram. In other words, the threshold values normalize the histogram prior to obtaining a bilateral difference image between the left and the right breast images. Col. 6, line 66 - col. 7, line 13. Such a normalization of the histogram does not detect suspected anomalous shadows.

For at least the above reasons, claim 1 is believed to be patentable.

Claim 2, which depends from claim 1, is believed to be patentable for at least the reasons submitted for claim 1.

Claim 3 is believed to be patentable for at least the reasons similar to those submitted for claim 1.

Claims 4, 5, 6/3, 6/4, 6/5, which depend from claim 3, are believed to be patentable for at least the reasons submitted for claim 3.

Applicant submits that claim 7 is patentable because Giger fails to disclose or suggest an anomalous shadow detecting means which utilizes a predetermined detection parameter and a parameter setting means for automatically setting the value of the detection parameter, as claimed. As argued above, the threshold value taught by Giger does not disclose the claimed detection parameter. The threshold value merely provides a way for the normalization of the right and left breast histogram images and does not serve to detect anomalous shadows.

Claim 10/7, which depends from claim 7, is patentable for at least the reasons submitted for claim 7. In addition, claim 10 is patentable because Giger fails to disclose the claimed standard phantom.

Rejection of Claims 8, 9/7, 9/8, 10/8, and 11 under 103(a) over Giger in view of Norimatsu

Norimatsu discloses an image processing method and apparatus employing a method for edge portion extraction so as to perform image processing operations such as sharpness enhancement, grain suppression and the like on a color image signal.

Claims 8, 9/7, 9/8, 10/8, and 11, which depend from claim 7, are patentable for at least the reasons submitted for claim 7.

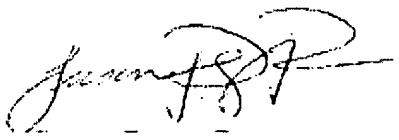
In addition, Applicant adds new claims 12-18 and submits that the new claims are fully supported in the original disclosure and the understandings of one skilled in the art. The new claims are patentable for at least the reasons submitted in their respective base claims.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the

Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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